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Sang Seol Kim

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EXAMINER

WOZNIAK, JAMES S

ART UNIT

PAPER NUMBER

2655

8

DATE MAILED: 06/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/934,475

Applicant(s)

KIM ET AL.

Examiner

James S. Wozniak

Art Unit

2655

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 8/23/2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1,5-11 and 13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1, 5-11, and 13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☒ Certified copies of the priority documents have been received in Application No. 09/321,626.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

**Detailed Action**


***Information Disclosure Statement***

1. The information disclosure statement filed 1/28/01 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. It has been placed in the application file, but the information referred to therein has not been considered.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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3. **Claims 7<sup>8</sup> and 11** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding **Claims 7 and 11**, the phrase "for example" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

The examiner has assumed the plurality of switches to be present in a number of any various locations on a toy, with respect to Claim 7, and any volume adjustment command, with respect to Claim 11, for the application of the prior art

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 1, 5, and 9-11** are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyazawa et al (*U.S. Patent: 5,983,186*) in view of Stanford et al (*U.S. Patent: 5,615,296*).

With respect to **Claim 1**, Miyazawa discloses:

A speech input/output part for converting at least one sentence of the dialogue partner's speech signal stored in said second memory into an electrical speech signal to output the converted signal (*A/D converter for converting a speech input into a digital signal, which further sends the signal to a sound signal analyzer, Col. 6, Lines 46-48*) and for audibly transmitting the speech signal restored to the dialogue partner (*speech output for broadcasting synthesized speech to a user, Col. 3, Lines 10-12*);

Although Miyazawa does not specifically teach storing an input speech data from a user, the examiner takes official notice that it is well known in the art to store an input speech signal in order to perform the necessary signal pre-processing for speech recognition. Also, it would have

been obvious to one of ordinary skill in the art, at the time of invention, to combine the speech input (*Col. 2, Lines 58-59*) and output (*Col. 3, Lines 10-12*) units disclosed by Miyazawa into one device in order to conserve space within the toy for other processing/operation devices.

A circular buffer in which the dialogue partner's digital speech signal outputted from said speech input/output part is temporarily stored;

Although Miyazawa does not specifically suggest the use of a buffer to temporarily store input speech, the examiner takes official notice that it is well known in the art to store an input speech signal in a buffer in order to perform necessary speech processing for recognition such as feature extraction (*feature extraction Col. 6, Lines 49-57*), segmentation, or template comparison.

A dialogue manager for selecting at least one response sentence from said first memory to match the content of the speech recognized in said speech recognizer with a predetermined scenario (*speech recognition interactive controller used to understand a speech command and generate an appropriate response, Col. 3, Lines 2-7*);

An analog/digital and digital/analog converter arranged between said speech decoder and said speech input/output part, for converting one side of analog and digital speech signals into the other side thereof (*A/D converter, Col. 6, Lines 46-48 and speech output unit, Fig. 1, Element 8*); and

Although Miyazawa does not specifically teach the use of a D/A converter, the examiner takes official notice that it is well known in the art to utilize a D/A converter at a sound output in order to generate speech or audio, thus it would have been obvious to one of ordinary skill in the

art, at the time of invention, to use a D/A converter at the speech output unit taught by Miyazawa in order to generate speech audio.

A memory controller arranged between said second memory and said speech recognizer, for moving the data from said first memory to said second memory (*interaction controller consisting of a processing unit and a ROM, Col. 8, Lines 39-42, that obtains response information by referencing a response data memory (moving speech data) to further transmit response data to a speech synthesizer, Col. 8, Lines 43-52*).

While Miyazawa does teach a speech recognizer capable of recognizing words (Col. 8, Lines 53-66), it is not specifically taught that the speech recognizer utilizes compressed speech data and a Viterbi algorithm to recognize input speech, however Stanford discloses a speech recognition system featuring compressed speech data (*Col. 9, Lines 46-48*).

Miyazawa and Stanford are analogous art because they are from a similar field of endeavor in speech recognition. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to combine the use of compressed speech data in a speech recognition system as taught by Stanford with the speech-enabled interactive toy taught by Miyazawa to provide for the storage of more speech information in a smaller memory space by utilizing compressed speech data. Also, the examiner takes official notice that it is well known in the art to utilize a Viterbi algorithm in pattern matching applications, specifically for word recognition. Therefore, it would have been obvious to one of ordinary skill in the art, at the time of invention, to utilize a Viterbi algorithm to recognize input words since the Viterbi algorithm is commonly used for speech recognition and software and systems utilizing such an algorithm are readily available. Furthermore in order to utilize the compressed speech

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information, it would have been obvious to implement a decoder since the examiner takes official notice that it is well known in the art to extract compressed speech data using a decoder for applications such as audio playback. Therefore, it would have been obvious to combine Stanford with Miyazawa for the benefit of obtaining more efficient memory usage in a speech recognizer through the use of compressed speech data, to obtain the invention as specified in Claim 1.

With respect to **Claim 5**, Miyazawa further recites:

A list controller for extracting the speech data and the speech-recognizing constant from said first memory and for moving the speech recognizing data to said second memory (*speech comprehension interaction controller consisting of a processing unit and a ROM, Col. 8, Lines 39-42, that obtains response information by referencing a response data memory (moving speech data) to further transmit response data to a speech synthesizer, Col. 8, Lines 43-52*).

With respect to **Claim 9**, Miyazawa further discloses:

A first microphone for converting the dialogue partner's speech and the noise generated from the outside into an electrical signal to thereby output the converted signal to said circular buffer (*speech and noise input via a microphone and further A/D conversion, Col. 6, Lines 38-48*);

A power amplifier for amplifying the extended and restored speech signal from said speech decoder to audibly deliver the amplified signal via a speaker to the dialogue partner (*increasing voice levels for synthesized speech with increasing noise levels, Col. 5, Lines 38-4, and the examiner takes official notice that it is well known in the art to use a power amplifier as a means of increasing the voice volume levels*).

Miyazawa in view of Stanford does not teach the use of a second microphone for obtaining and converting noise data, however, it would have been obvious to one of ordinary skill in the art, at the time of invention, to implement a second microphone in order to separately obtain and process noise to perform the noise analysis necessary to properly adjust noise threshold levels (*Miyazawa, Col. 5, Lines 8-20*), for increased recognition accuracy in a noisy environment, *and* improve processing efficiency by separately processing speech and noise.

With respect to **Claim 10**, Miyazawa further discloses the A/D converter as applied to Claim 1, which is implemented after the microphone input and before speech processing means (*Col. 6, Lines 46-48*). Also, as noted with respect to Claim 1, it would have been obvious to implement a D/A converter in order to convert an audio signal into a playback format. Furthermore, the examiner takes official notice that it is well known in the art to implement a D/A converter after synthesis data obtaining step and before a sound-generating device such a speaker in order to convert an audio signal into an analog format for playback. Thus, it would have been obvious to one of ordinary skill in the art, at the time of invention, to implement a D/A converter between a speech decoder and power amplifier.

With respect to **Claim 11**, Miyazawa in view of Stanford teaches the interactive toy utilizing compressed speech data for recognition and playback, as applied to Claim 1. Miyazawa in view of Stanford does not teach the use of a speech-activated volume control, however since the examiner takes official notice that it is well known in the art to control a device volume using a speech command, as is common in speech-enabled televisions and remote controls, it would have been obvious to one of ordinary skill in the art, at the time of invention, to provide a



speech-enabled volume adjustment means to allow a user to easily change the volume to a desired level, thus providing for less complex toy operation that is easier for children to control.

6. **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyazawa et al in view of Stanton et al, and in further view of Ireton (*U.S. Patent: 5,970,447*).

With respect to **Claim 6**, Miyazawa in view of Stanford teaches the interactive toy utilizing compressed speech data for recognition and playback, as applied to Claim 1, and Miyazawa further discloses:

A speech-recognizing calculator to thereby calculate an inherent value for a single character as feature vector data (*extraction of speech features, Col. 6, Lines 49-57*);

Although Miyazawa does not specifically disclose a noise elimination means, the examiner takes official notice that it is well known in the art to utilize a device such as a noise-canceling microphone in order to eliminate noise from a speech signal, thus, it would have been obvious to one of ordinary skill in the art, at the time of invention, to eliminate noise from a speech signal using a noise-canceling device such as a microphone or filter in order to improve recognition accuracy.

Miyazawa in view of Stanford does not teach the use of a zero-crossing method in word detection; however, the use of zero-crossing methods for word detection is well known in the art as is evidenced by Ireton:

A zero-crossing rate for detecting a zero point in a sampling value of the digital speech signal (*zero-crossing rate, Col. 2, Lines 32-34*);

A power energy for calculating energy for the zero point to improve the reliability for the zero point detection at said zero-crossing rate (*analysis of signal magnitude in determining the zero-crossing rate, Col. 4, Lines 44-50*);

A unit speech detector for detecting endpoint data of any one word of the continuous digital speech signals based upon the output signal of said zero-crossing rate and said power energy (*discriminator for detecting the instantaneous start of end of speech based upon a zero-crossing rate, Col. 3, Lines 60-62*);

Although Ireton does not specifically suggest the use of a segmentation means for dividing a speech signal into words, the examiner takes official notice that it is well known in the art to utilize a segmentation means for dividing a speech signal into words for speech recognition of natural language, thus, it would have been obvious to one of ordinary skill in the art, at the time of invention, to utilize a word partitioning means to divide a speech signal into words in order to recognize the individual words within a speech command.

Miyazawa, Stanford, and Ireton are analogous art because they are from a similar field of endeavor in speech signal processing. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to combine the use of a zero-crossing technique for individual word detection as taught by Ireton with the interactive toy utilizing compressed speech data for recognition and playback as taught by Miyazawa in view of Stanford to provide for keyword detection in natural speech recognition, thus providing for a more user-friendly toy that does not require the utterance of specific word sequences to initiate a command. Therefore, it would have been obvious to combine Ireton with Miyazawa in view of Stanford for the benefit

of obtaining a natural language word detection means in a speech-enabled toy, to obtain the invention as specified in Claim 6.

7. **Claims 7 and 8** are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyazawa et al in view of Stanford et al in further view of Kikinis (*U.S. Pub. 2002/0049833*).

With respect to **Claim 7**, Miyazawa in view of Stanford teaches the interactive toy utilizing compressed speech data for recognition and playback, as applied to Claim 1. Miyazawa in view of Stanford does not teach the use of multiple switches that invoke a particular speech response upon user contact, however Kikinis recites:

Plurality of touch switches mounted on plural areas and serving to inform said speech decoder of the dialogue partner's contact with said toy body (*tactile sensors that elicit various responses when touched, Page 10, Paragraph 125, Fig. 9*).

Miyazawa, Stanford, and Kikinis are analogous art because they are from a similar field of endeavor in speech recognition. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to combine the use of multiple tactile sensors for detecting a user touch to generate an appropriate response as taught by Kikinis with the interactive toy utilizing compressed speech data for recognition and playback as taught by Miyazawa in view of Stanford to generate an appropriate speech response to a user utilizing the decoder, compressed speech data, and synthesizing means noted with respect to Claim 1, upon user contact with one of a plurality of tactile sensors in order to increase the level of toy interactivity and realism. Therefore, it would have been obvious to combine Kikinis with Miyazawa in view of Stanford for the benefit of obtaining a more realistic interactive toy,

responsive to user touch via a number of tactile sensors, to obtain the invention as specified in Claim 7.

With respect to **Claim 8**, Miyazawa in view of Stanford teaches the response generating and speech synthesis means, as applied to Claim 1, while Kikinis discloses the tactile sensors for eliciting associated responses upon user contact, as applied to Claim 7.

8. **Claim 13** is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyazawa et al in view of Stanford et al, and in further view of Cummings (*U.S. Patent: 4,799,171*).

With respect to **Claim 13**, Miyazawa in view of Stanford teaches the interactive toy utilizing compressed speech data for recognition and playback, as applied to Claim 1. Miyazawa in view of Stanford does not teach a single chip containing a buffer, speech recognizer, dialogue manager, decoder, list controller, timer, and clock generator; however, it is well-known in the art to combine such elements in a chip such as a microcontroller as is evidenced by Cummings:

Circular buffer, said speech recognizer, said dialogue manager, said speech decoder, said list controller, a timer and a clock generator are all contained within a single chip (*microcomputer chip used for speech recognition, featuring a CPU, clock, ROM, RAM, I/O, and timer, Col. 6, Lines 59-65*).

Miyazawa, Stanford, and Miyazawa are analogous art because they are from a similar field of endeavor in speech recognition. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to combine the use of a single chip containing various recognition and memory elements as taught by Cummings with the interactive toy utilizing compressed speech data for recognition and playback as taught by Miyazawa in view of

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Stanford to conserve space within a toy for other necessary operating devices and eliminate the need for separate speech signal processing devices by utilizing a microcomputer chip.

Therefore, it would have been obvious to combine Cummings with Miyazawa in view of Stanford for the benefit of eliminating the need for separate speech signal processing devices within a toy, to obtain the invention as specified in Claim 13.

### ***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:


- Curran (*U.S. Patent: 4,923,428*)- teaches an interactive toy utilizing a zero-crossing method for word detection.
- Cox, Jr. et al (*U.S. Patent: 5,832,439*)- teaches a speech-enabled television utilizing commands relating to volume adjustment.
- Häb-Umbach et al (*U.S. Patent: 5,950,166*)- discloses the use of a FIFO buffer with a speech recognizer.
- Immarco et al (*U.S. Patent: 5,991,726*)- teaches the use of a noise-canceling microphone to separate noise from speech in a speech recognition system.
- Ali et al (*U.S. Patent: 6,044,346*)- discloses a means of endpoint detection to recognize words in a natural language speech recognizer.
- Ghaly (*U.S. Patent: 6,663,393*)- teaches an interactive toy featuring speech recognition means.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James S. Wozniak whose telephone number is (703) 305-8669 and email is James.Wozniak@uspto.gov. The examiner can normally be reached on Mondays-Fridays, 8:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Talivaldis Ivars Smits can be reached at (703) 306-3011. The fax/phone number for the Technology Center 2600 where this application is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the technology center receptionist whose telephone number is (703) 306-0377.

James S. Wozniak  
5/25/2004

  
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